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09/771,275	01/26/2001	Konstantinos I. Papathomas	EN995064BVUS4	7979

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ARLEN L. OLSEN  
SCHMEISER, OLSEN & WATTS  
3 LEAR JET LANE  
SUITE 201  
LATHAM, NY 12110

EXAMINER

BERMAN, SUSAN W

ART UNIT PAPER NUMBER

1711

6

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Please find below and/or attached an Office communication concerning this application or proceeding.

AS-6

# Office Action Summary

Application No.

09/771,275

Applicant(s)

PAPATHOMAS ET AL.

Examiner

Susan W Berman

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Pri rity under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

***Response to Arguments***

Applicant's arguments filed 01-04-2002 have been fully considered but they are not persuasive.

With respect to the obviousness-type double patenting rejection of record, applicant argues that a restriction requirement was made in the parent application Serial No. 08/874220 which makes the rejection improper. This argument is not persuasive because the restriction requirement in Serial No. 08/874220 was made between claims to an article including an encapsulant obtained by polymerizing an epoxide and a dispersed phase of particulate silica and a polymerizable cyanate ester composition. The restriction requirement was not made between the claims drawn to a method of encapsulating a solder joint in US 6,129,955 and the method claims presented in the instant application.

With respect to the rejections of claims under 35 USC 103(a), applicant argues that Christie et al, Gelorme et al and Gaku et al do not teach or suggest a method including the treatment of filler with a surface treating agent. However, Christie et al teach that the preferred filler is high purity fused or amorphous silica that is optionally treated with a coupling agent (column 5, lines 24-28).

***Information Disclosure Statement***

The information disclosure statement filed 01-26-2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

***Specification***

The amendment filed 01-04-2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (1) the recitation in claim 13 that replaces "dispersed silica" with "dispersed filler, wherein the filler has been treated with a surface treating agent", (2) the recitation in claim 23 "based on 100 parts of

Art Unit: 1711

the cyanate ester”, (3) the recitation in claim 20 that the particle size of the dispersed filler is less than or equal to 31 microns (4) formulas 1 and 2 set forth in claim 15. The original claims recite a filler but do not mention a filler treated with a surface treating agent. The claims entered in Amendment A require a dispersed silica. Claim 23 recites a composition including surface treating agents. Claim 24 recites thermally conductive and electrically insulating fillers. The examiner has not found any disclosure in the specification of dispersed filler treated with a surface treating agent. See pages 4, 12, 24 and the Examples. With regard to claim 23, the Specification sets forth “based on 100 parts of resin”. The term “resin” is not limited to the cyanate ester disclosed. With regard to claim 20, the specification teaches that the particulate silica has a particle size of 31 microns or less on page 25, lines 4-6. With regard to claim 15, see the formulas on pages 19 and 20.

Applicant is required to cancel the new matter in the reply to this Office Action.

*Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13-17 and 20-28 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a composition comprising a cyanate ester, a photoinitiator and a dispersed phase of particulate silica and an optional thermally conductive and electrically insulating filler, does not reasonably provide enablement for compositions not comprising a dispersed silica in addition to the thermally conductive and electrically insulating filler. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. See page 4, lines 9-12, page 19, lines 4-12, page 24, lines 24-28, page 25, lines 4-10, and Example 4.

Art Unit: 1711

The specification, while being enabling for the cyanate ester formulas set forth on pages 19 and 20, does not reasonably provide enablement for formulas 1 and 2 set forth in claim 15

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gelorme et al (5,464,726).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring.

Gelorme et al disclose compositions comprising a curable cyanate ester, a cationic photoinitiator, cycloaliphatic polyepoxide and a filler. Thus Gelorme et al teach that a cationic photoinitiator and photocuring can be employed to cure a composition analogous to the composition disclosed by Christie et al.

It would have been obvious to one skilled in the art to employ a photoinitiator and photocuring in the compositions and method disclosed by Christie et al, as suggested by Gelorme et al in analogous art. The reason is that Christie et al and Gelorme et al disclose compositions comprising the same polymerizable components. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring would provide the same product as heating since the polymerizable components are the same.

Claims 13-22 and 24-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gaku et al (4,554,346).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring in the disclosed method.

Gaku et al disclose curable resins comprising a cyanate ester compound, a hydroxy-functional ethylenically unsaturated compound and a photoinitiator that provide products having excellent heat resistance and electrical properties. Reinforcing agents and fillers taught by Gaku et al include epoxy resins, elastic rubbers, silica, alumina and boron nitride (columns 6-7).

It would have been obvious to one skilled in the art to employ a photoinitiator and photocuring in the compositions and method disclosed by Christie et al, as suggested by Gaku et al in analogous art. The reason is that Christie et al and Gaku et al disclose compositions comprising the same polymerizable components. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring would provide the same product as heating since the polymerizable components are the same. It would have been obvious to one skilled in the art to include the reinforcing agents and fillers taught by Gaku et al in the compositions disclosed by Christie et al in order to obtain the reinforcing and filler properties of these additives taught by Gaku et al. With respect to claim 17, It would have been obvious to one skilled in the art to select diphenyliodonium initiator from those taught by Gaku et al because Gaku et al teach that any of the disclosed initiator/sensitizers can be used and because the compositions taught by Christie et al include epoxy compounds that are known to be photocurable in the presence of iodonium initiators.

Art Unit: 1711

Claims 13-16 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of McCormick et al (5,744,557).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring in the disclosed method.

McCormick et al teach cyanate ester/free radically polymerizable monomer adhesives for electronic adhesives. See column 19, line 611, to column 23, line 22. McCormick et al teach that the disclosed catalyst system of organometallic curative and free radical generators may be activated thermally or photochemically or by both methods in combination (column 6, lines 37-40, and column 20, lines 17-21). Other photoinitators are taught in column 11, lines 40-50.

It would have been obvious to one skilled in the art to employ an organometallic catalyst system and photoinitiation, as taught by McCormick et al, in the compositions and method disclosed by Christie et al. The reason is that Christie et al and McCormick et al disclose compositions comprising the same cyanate ester and epoxy polymerizable components. McCormick et al teach that cyanate ester/epoxy compositions can be photocured and provide adhesives for electronic applications. Therefore, one of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring the cyanate ester compositions taught by Christie et al would provide the same product as heating since the polymerizable compositions taught by McCormick et al also comprise cyanate esters.

Art Unit: 1711

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view each of Gelorme et al, Gaku et al and McCormick et al, as applied to claim 13 above, and further in view of Papathomas et al (5,194,930). Christie et al teach using silica filler optionally treated with a coupling agent. Papathomas et al disclose amino- and epoxy-functional silane coupling agents for treating high purity fused or amorphous silica in compositions analogous to those taught by Christie et al, Gelorme et al, Gaku et al and McCormick et al (column 10, lines 47-56). It would have been obvious to one skilled in the art to employ the coupling agents taught by Papathomas et al as the coupling agent taught by Christie et al. The coupling agent taught in the prior art corresponds to the surface treating agents instantly disclosed, as is well known in the art.

### ***Double Patenting***

Claims 13-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,129,955 in view of Christie et al. Although the conflicting claims are not identical, they are not patentably distinct from each other because the comprising language of the claims of US '955 encompasses compositions including a cyanate ester, such as the cyanate esters disclosed in columns 11-12 of the patent. Christie et al teach, in analogous art, that compositions comprising a cycloaliphatic polyepoxide and/or cyanate ester or prepolymer thereof are useful for providing a solder interconnection. It would have been obvious to one skilled in the art to include a cyanate ester compound in the polyepoxide compositions used in the method claimed in US '955 and to photocure the compositions as set forth in the claims.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA



Art Unit: 1711

1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ayano et al (4,393,903) disclose cyanate ester compositions comprising a photoinitiator for use in adhesive assembly. Bolger teaches conductive adhesive performs comprising conductive and non-conductive fillers for area bonding of electronic components.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Berman whose telephone number is (703) 308-0040.

The fax number for this group is (703) 872-9310 or, for submissions after Final Rejection, (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist at telephone number (703) 308-0661.

S B  
1/31/02



Susan Berman  
Primary Examiner  
Art Unit 1711